

Vermont Telecommunications Initiatives and Activities

Vermont is a state of much activity related to the development of a telecommunications future. Telecommunications service providers, users, advocates, and others are all responsible for a long list of ways in which Vermont organizations and Vermonters are applying, developing, or facilitating the developments in telecommunications technology. This document collects and describes a cross-section of this activity.

The Public Service Department (PSD) collected information about these initiatives and activities in a variety of ways. Formal and informal interviews with key users and service providers are an important and continuing means of collecting information on “who is doing what” in Vermont. Furthermore, in June and July 2002, the PSD, in conjunction with the Vermont Broadband Council, the Vermont State Colleges, the Vermont Rural Development Council, the Department of Economic Development, the Vermont Telecommunications Advancement Center, and the Offices of Senators Jim Jeffords and Patrick Leahy invited a range of Vermont institutions, state agencies, business consumers, and non-profits to a meeting entitled “High-Speed Telecommunications Services in Vermont: Increasing Demand to Improve Access,” held July 26, 2002, at Vermont Technical College. As part of this effort, the PSD sponsored a questionnaire that was sent to the invitees and was designed in part to identify the many ways that the organizations participating in the conference were using high-speed telecommunications and their efforts to promote Vermonters’ access and use of the technology. This was by no means intended to take a comprehensive inventory of all activity related to high-speed telecommunications in Vermont, but it helped to catalog many interesting examples.

The Vermont Telecommunications Plan is also charged with an assessment of the current state telecommunications system. To that end, the PSD conducted a series of interviews with various state agency personnel in the spring and summer of 2002. The use of telecommunications and telecommunications-related concerns pervade state government. It is not possible to capture

Figure 2.1:
Vermont.gov: Vermont’s new e-government portal



completely all the activity of state government in this area in a short document. What follows includes a summary of the major areas of activity, with highlights on the activities of several agencies, especially those facing significant changes.

A. Service Providers

INCUMBENT TELEPHONE COMPANIES

INDEPENDENT TELEPHONE COMPANIES

Independent telephone companies (ITCs) have existed across the country for decades, in many cases since the area served first received telephone service. ITCs are different from their large Regional Bell Operating Company (RBOC) counterparts and even from each other. Some ITCs are part of national corporations, other ITCs exist as a result of larger companies divesting properties, and still others originated and remain as small, family-owned businesses. Often times, ITC markets are in rural areas of the country where costs to serve are higher than national averages and demand is constrained by lower population densities. The nine Vermont ITCs are no different and in fact each fits one of the categories listed above. These companies collectively provide local telephone service to roughly 15% of Vermont's access lines. Since the last Telecommunications Plan, ownership of some of these companies has changed hands. Another small telephone company, Citizens Tel Co. of Hammond, NY purchased Topsham Telephone.

The relationship between Vermont regulators and the Vermont ITCs has been one of traditional utility rate of return regulation: (i) monitoring for adherence to acceptable levels of service quality; (ii) rate making to ensure just, reasonable, and non-discriminatory charges to consumers; (iii) oversight and approval of expenses and investment to ensure modern networks. This relationship has manifested itself in both formal proceedings and informal negotiations amongst the Public Service Board (PSB), PSD and ITCs, including periodic review of each company's cost of service and earnings. During 2001 and 2002, settlements reached between companies and the PSD were approved by the PSB and achieved annual revenue reductions totaling approximately \$2.6 million. In the area of broadband deployment, many ITCs have been leaders, and collectively the ITCs have deployed Digital Subscriber Line (DSL) service throughout nearly all of their service

Accomplishments of Two Independent Phone Companies Since the Last Telecom Plan

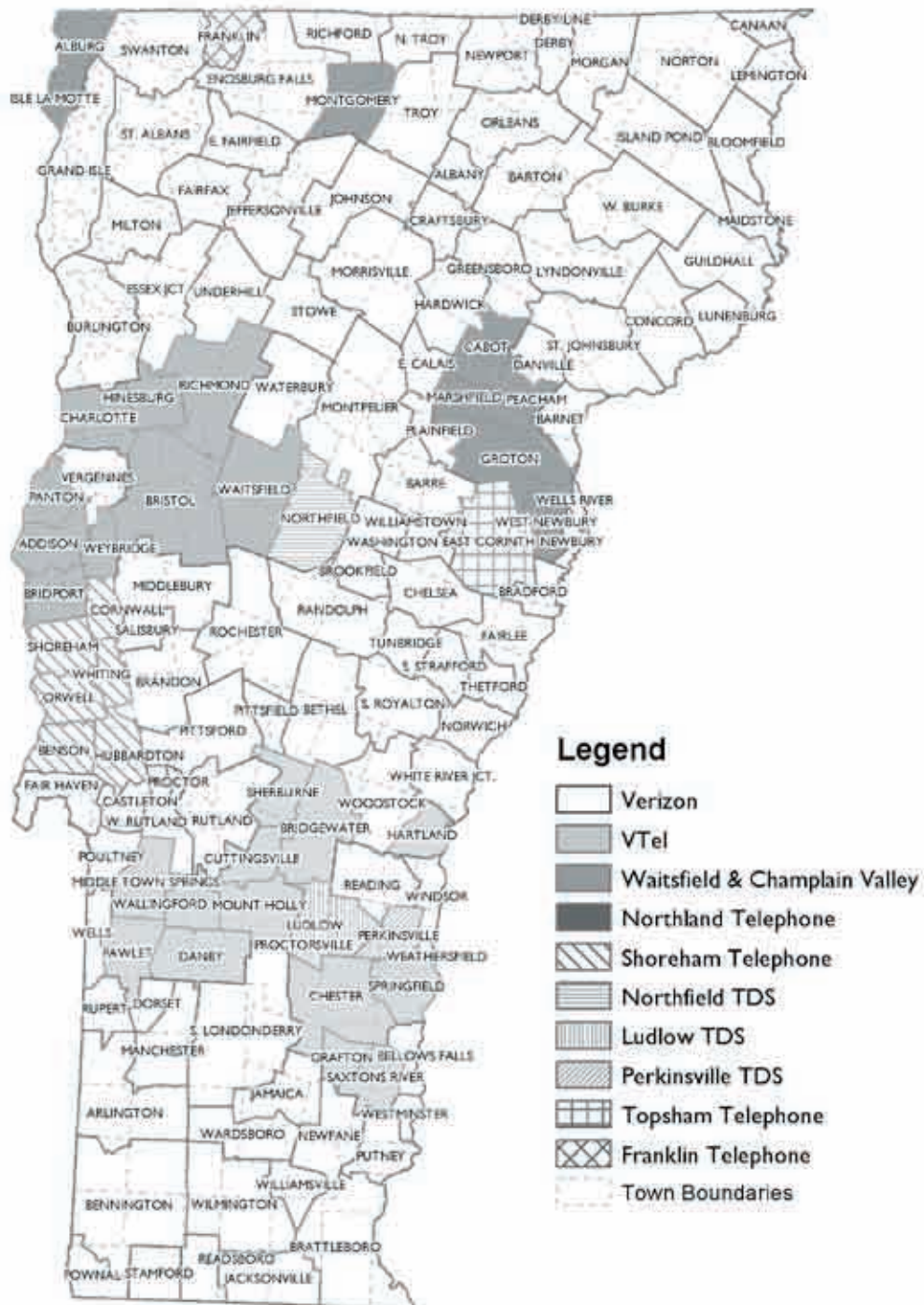
VTel (21,717 access lines)

- ▶ Vermont's largest independent telephone company.
- ▶ Eliminated its voice auto-attendant for incoming calls to its service center and achieved a call-answer time of 99% calls answered in 20 seconds or less.
- ▶ Made DSL available to 99% of customers, with 21% of customers taking DSL at year's end 2002.
- ▶ Increased DSL speeds from 900 kbps to 7 Mbps.

Franklin Telephone (889 access lines)

- ▶ Vermont's smallest independent telephone company.
- ▶ Made DSL available to 98% of their customers.
- ▶ Converted interexchange facilities to fiber optics.
- ▶ Introduced retail in-state and interstate long distance service.

Figure 2.2:
Incumbent telephone companies



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territory. ITCs have consistently met and exceeded generic service quality benchmarks that the PSB established for telephone companies.

Competition has not developed as quickly or extensively in ITC territories, and these companies do not have the same obligations as Verizon does to sell wholesale services and elements to competitors. Competition does exist to an extent, such as between cable companies and ITCs for broadband service in some locations. Competition for voice services from wireless providers and Voice over Internet Protocol (VoIP) is nascent. Although ITCs have long been the best remaining example of the traditional model of telecommunications in Vermont, these companies are anticipating a future that increasingly looks different due to changes in technology, the market, and regulatory policy.

VERIZON

The period since the last Telecommunications Plan has seen several diverse and important events related to Vermont's largest telephone company. The national merger of Bell Atlantic and GTE (following on the heels of the previous merger with NYNEX) created the combined company, Verizon, one of the largest telecommunications providers in the world. It has rolled-out DSL in some exchanges (although not to the extent that the independent telephone companies have, relatively speaking). Verizon continues to operate in Vermont under an Alternative Regulation Plan, adopted by the PSB in March 2000 pursuant to authority provided by the General Assembly under 30 V.S.A. §226b. The "Alt-Reg" Plan, which runs for five years, provides Verizon both incentives and regulatory flexibility to deploy new services and technologies and to respond to changes in the marketplace rapidly. The plan when issued provided for certain scheduled rate reductions over its life. It is due to expire April 22, 2005. The plan also created a service quality plan and set penalties for poor performance as measured under the plan. Under the plan Verizon created the Vermont Interactive Learning Network (ILN), and the plan required Verizon to provide unspecified benefits in the form of new or innovative service.

Verizon was also successful in obtaining approval for its request for authority to provide state-to-state long distance services originating in Vermont from the Federal Communications Commission (FCC). The Telecommunications Act of 1996 allows a former regional Bell such as Verizon to seek FCC approval to enter the long distance market in its local service territory. As part of the approval process, the FCC is required to consult the relevant state commission (in this instance the PSB) on the question of whether or not Verizon had irrevocably opened itself up to competition at the local level. The PSB issued a conditionally favorable recommendation to the FCC on August 7, 2001. The FCC approved

Accomplishments of Verizon Since the Last Telecom Plan

- ▶ Reduced intrastate access charges levied on long distance companies from \$.10/minute to \$.03/minute.
- ▶ Reduced monthly dial tone local rates for businesses and residences by \$1.00 and \$.40, respectively.
- ▶ Installed DSL in 26 exchanges.
- ▶ Introduced "Transparent LAN service" and Gigabit Ethernet service, among others.
- ▶ Introduced unlimited local usage service packages.
- ▶ Introduced (by approval of the FCC) retail interstate long distance services.
- ▶ Adopted a Performance Assurance Plan for its wholesale services.

Verizon's request and Verizon began offering long distance service on April 30, 2002.

CABLE COMPANIES

Since the last plan, there has been a large volume of activity in the cable industry in Vermont. Cable has gone from a delivery of television to a provider of data and video services. Most cable customers in Vermont now have access to high-speed Internet access over cable, often called cable modem services. By the end of 2003, cable customers served by a only a handful of the very smallest operators lacked access to these new services, while major cable system operators in Vermont offered cable modem service to most customers and were on the verge of offering cable modem services to all cable customers. In fact, Internet access services are now a key weapon in cable operators' arsenals to combat erosion of their customer base. At the end of 2003, Adelphia also introduced a limited selection of programming in high-definition format, as well as Personal Video Recorders (PVRs). To support the introduction of new data and other services, cable operators have recently spent millions of dollars to upgrade the capacity of their systems and provide two-way communications capacity. These systems are capable of providing hundreds of digital and analog channels.

According to Charter Communications, Vermont's second-largest cable operator spent \$18.3M to upgrade or rebuild all 567 miles of its cable plant over 3 years prior to the recent renewal of its franchise.

The PSB has granted a number of new or renewed cable franchises over the past several years, including three franchises granted to Adelphia operating companies for various pieces of its Vermont footprint shortly before and after the last Telecommunications Plan. In addition, franchises were granted to Duncan Cable for several towns in southern Vermont, (including principally West Dover) and North Country Cable for a range of towns in northern Vermont. The PSB renewed the franchise of Charter Communications, the second-largest cable operator in Vermont in 2003, and it renewed the franchise of White Mountain Cable, operating in the far northeast corner of the state, in 2002. Gateway Cable, in southern Vermont, received approval to be purchased by neighboring Duncan Cable in 2003.

Cable Evolution

The last five years

- ▶ Rebuilt nearly all systems to a hybrid fiber optic-coaxial cable design.
- ▶ Introduced digital-format channels.
- ▶ Increased bandwidth and offered more channels in packages.
- ▶ Introduced high-speed Internet access.

The next five years

- ▶ Personal Video Recorders and/or Video-on-Demand
- ▶ Telephone service
- ▶ High-Definition Television Programming

Adelphia has constructed 338 miles of line extensions in Vermont, a fraction of the approximately 1,600 miles of line extensions that it was obligated to build under its franchise obligations and prior settlements of litigation. The PSB opened an investigation into Adelphia's compliance with its obligations. The PSD and Adelphia reached a settlement in the case, which was approved by the PSB. The settlement sets annual mileage requirements beginning in 2004 that add up to Adelphia completing 1,262 miles of line extensions in rural areas by December 31, 2008. For Adelphia's future planned line exten-

Figure 2.3:
Vermont cable companies

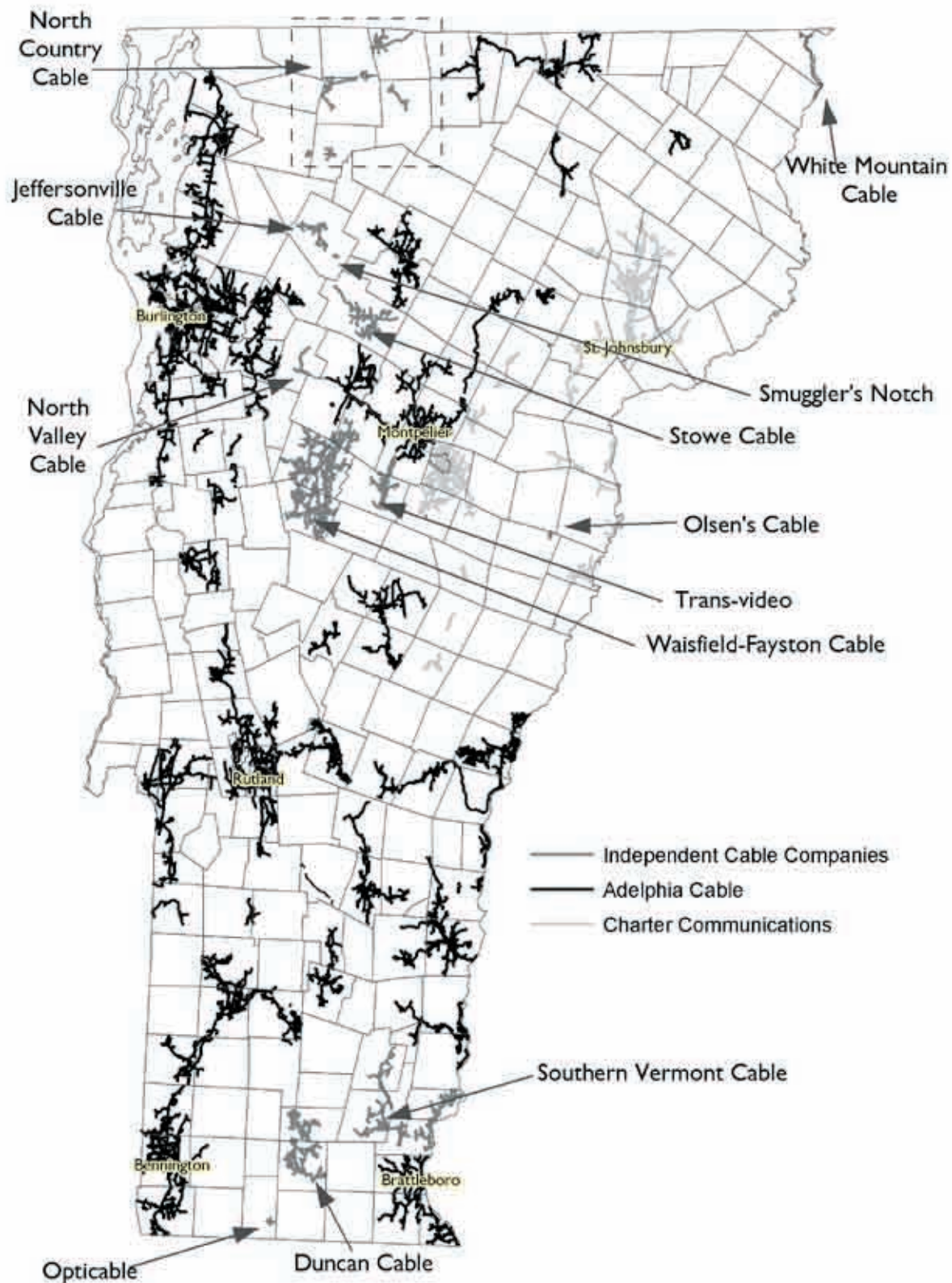
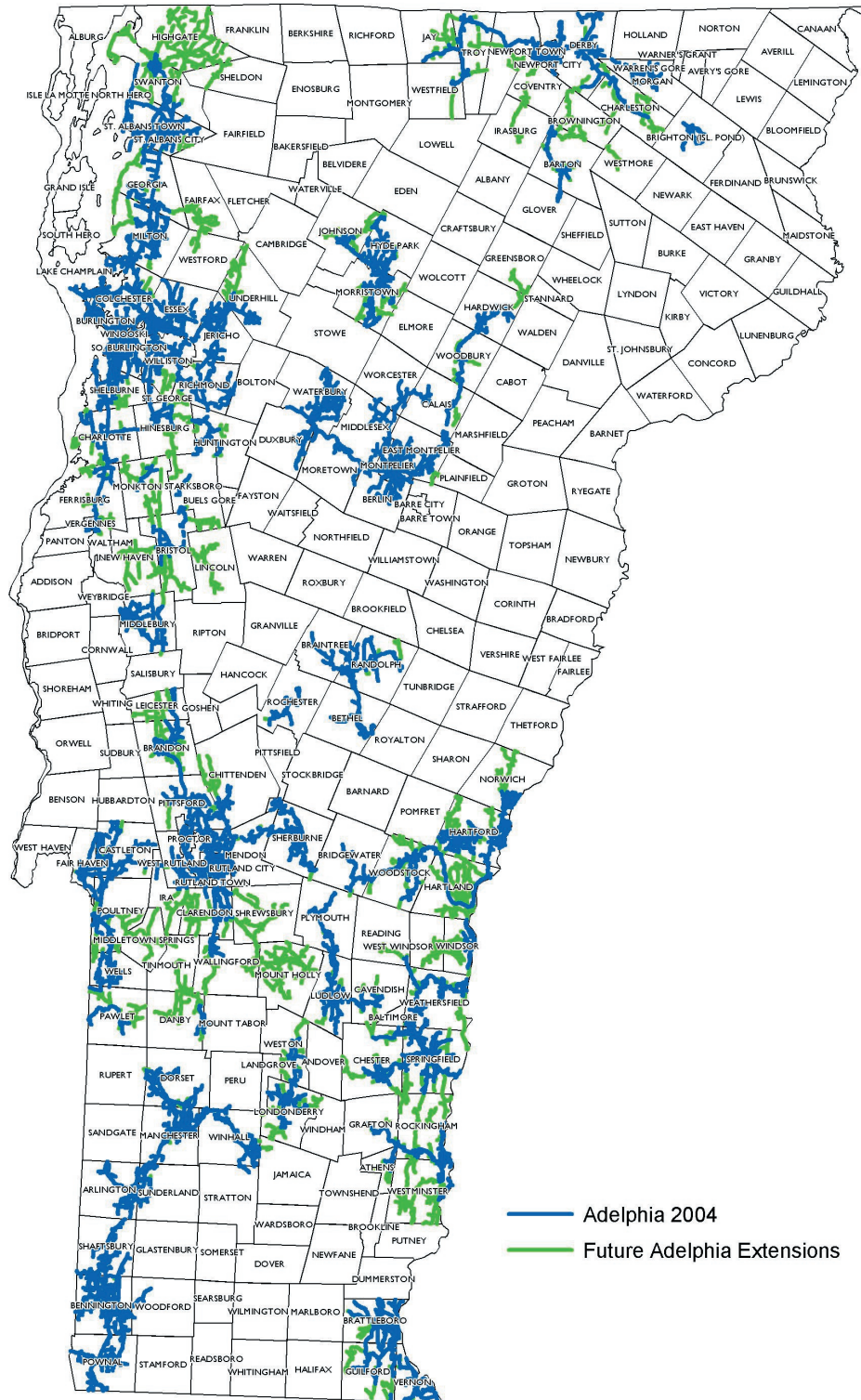


Figure 2.4:
Adelphia future line extensions



sions, see Figure 2.4. In lieu of fines for various issues raised in ongoing PSB proceedings, the company agreed to build 150 to 300 additional miles of service into rural areas that would be unlikely to qualify for line extensions in the foreseeable future if the agreement were not in place. Construction on the additional mileage may begin immediately and must be completed by December 31, 2009. To ensure Adelphia fulfills its obligation to build, the company must post a bond to secure any penalties due if the company fails to build on schedule. The bond amount starts at \$5 million in 2003, and increases to \$9 million in 2008. If in any year Adelphia fails to meet its building obligation by more than 20 miles, the entire cumulative bond amount must be posted on demand of the PSD.

COMPETITIVE AND ALTERNATIVE INFRASTRUCTURE PROVIDERS

CLECS

The significant weakening of capital markets for telecom companies, notably in 2000 and 2001, has slowed the progress of Competitive Local Exchange Carriers (CLECs), but not halted it. Telcove, formerly known as Adelphia Business Solutions and Hyperion, filed for protection under Chapter 11 of the U.S. Bankruptcy Code in 2002 following a spin-off from parent company Adelphia Communications and shortly before a Chapter 11 filing by Adelphia itself. Throughout the bankruptcy Telcove has limited its network growth, but has continued to provide service in Vermont. Telcove filed a reorganization plan in 2003 with the bankruptcy court and will likely emerge from bankruptcy in 2004. Numerous other CLECs filed for bankruptcy and either liquidated (typically selling their customer bases to another company) or reorganized. CTC Communications and MCI WorldCom were two CLECs with a significant presence in Vermont that underwent reorganization. Fortunately, no Vermont customers experienced interruption of local service due to the financial failure of a CLEC and only in one instance was long-distance service interrupted. Onestar faced a large-scale disconnection of its Vermont customers in the wake of a failure to pay Verizon for use of its underlying network. Nevertheless, other CLECs have weathered the storm. Lightship Telecommunications has established a Vermont presence and provides services to businesses. SoVerNet, which began as an Internet Service Provider (ISP), has evolved to be a provider of Internet, data, and telephone services to business and residential customers. National long distance providers AT&T and MCI also introduced their mass-market local residential and business service offerings into Vermont by leasing and reselling facilities owned by Verizon. Many CLECs now face a new round of challenges because of shifting federal rules regarding the terms on which they lease network elements from Verizon. (See “The Unbundling Debate” in Section 1, “Telecommunications Trends.”) A federal appeals court threw out many of the FCC’s rules governing the wholesale relationship between CLECs and companies like Verizon. It seems likely that new rules will be less favorable to those competitors that lease facilities from incumbents. AT&T has already announced that it intends to stop marketing intended to acquire new residential customers (although it will continue to serve existing customers and will not turn away those requesting service).

MUNICIPAL NETWORKS

Nationally, a number of municipalities or government consortia have entered into the business of providing telecommunications services to consumers or merely providing the infrastructure over which various carriers can provide services. In Vermont, there are a small number of municipalities who have taken steps down this road to a greater or lesser extent. The most notable is the City of Burlington. Originally, the city formed a joint venture with private investors to build a citywide fiber optic network offering voice, video, and data to city residents and businesses. When the financing for this venture could not be secured, the city adopted a more incremental approach. Burlington constructed a fiber optic network connecting municipal and school buildings, financing the project out of current and projected spending on telecommunications services. The city provides its own voice and data connectivity internally, and contracts for external connectivity and the switching of its voice services. The City of Burlington filed with the PSB under the trade name Burlington Telecom for authority to offer telecommunications services to entities other than city agencies. It offers fast Ethernet services to businesses and institutions along its existing fiber routes that wish to interconnect locations within the city or connect to outside service providers at the collocation center maintained by the city. The city retains the option of building out to additional business customers and to residents at a future time.

Elsewhere, the City of Montpelier, with the participation of the Vermont Broadband Council, is examining the construction of a wireless network to connect city locations for data services. Montpelier is also looking at forming a buying consortium of businesses and institutions to share bandwidth on a very high-speed Internet connection, which would be connected to individual locations via point-to-point wireless connections. At a much more preliminary stage, the Village of Morrisville obtained a municipal charter change in 2001 that allows the municipal power and water utility to offer telecommunications services. To date, the village has not actively pursued this option.

WIRELESS PROVIDERS

The last several years have seen a flurry of activity as a number of new service providers and real estate developers have made proposals to establish new towers or other types of new antenna sites. The result has been the introduction of services by two new wireless carriers, Sprint PCS and Nextel, in addition to the existing cellular service providers, RCC Wireless (d/b/a Unice), Verizon Wireless, and U.S. Cellular. New service so far is limited in its availability.

Table 2.1:
Cellular and PCS companies marketing
service in Vermont 2000 and 2004

January 2000	January 2004
RCC (Cellular One)	RCC (Unice)
Bell Atlantic Mobile	Verizon Wireless
U.S. Cellular	U.S. Cellular
	Sprint PCS
	Nextel

There has been a degree of variability in the potential new entrants into the wireless market in Vermont. VTel sold its spectrum licenses to AT&T. Devon Mobile, an Adelphia affiliate, had been actively seeking sites in Vermont, but filed for Chapter 11 bankruptcy protection in 2002 and was subsequently liquidated. Licenses previously held by Devon were

acquired by Verizon and U.S. Cellular and have increased the licensed footprint of these two carriers in Vermont. Other national carriers who hold FCC licenses for Vermont include T-Mobile and AT&T Wireless.¹ AT&T Wireless is in the process of being acquired by Cingular.

The range of services offered by wireless service providers has expanded, as have the diversity of siting requirements. Digital cellular service is now more commonplace and offers greater clarity, though frequently with a more limited range. PCS (Personal Communications Service), currently offered by Sprint PCS is also a digital service operating at a higher frequency and requiring more antennas to cover the same area. Text messaging and walkie-talkie-like push-to-talk features are examples of new variations on plain wireless voice service. Some providers have introduced mobile Internet-access services while a handful of small Vermont ISPs have begun using license-free wireless spectrum to provide high-speed fixed wireless Internet access.

Finally, some wireless carriers have begun to show signs that they will compete seriously in Vermont for wireline customers. An especially notable sign in this direction is RCC's successful bid for designation as an Eligible Telecommunications Carrier (ETC) in exchanges served by Verizon. This designation, obtainable by carriers that provide an equivalent to basic telephone service, will qualify RCC Wireless for support from the Federal Universal Service Fund equivalent to that for which Verizon now qualifies. RCC has subsequently applied for ETC designation in exchanges served by independent telephone companies, and that application has gone before the PSB.

INTERNET SERVICE PROVIDERS

The Internet Service Provider business has reached a plateau and a turning point in Vermont, as it has elsewhere. Vermont-based and national ISPs have made considerable progress in signing up Vermont residents and businesses. Yet with the migration to broadband services beginning to pick up steam, ISPs who only sell dial-up service face an uncertain future. While it is unlikely that dial-up is going to disappear overnight, it is clearly a legacy business line. Some ISPs, like SoVerNet and Powershift Online, have responded by entering the CLEC market, which allows them to access telephone company lines at reduced rates for providing DSL service. Other ISPs, mirroring a trend in the national market among small ISPs, are experimenting with wireless delivery of high-speed

Different Types of Digital Wireless Service

While invisible to most consumers, there is an ongoing conversion in the radio frequency modulation scheme used by Vermont carriers. This conversion is capital-intensive. In the initial conversion from analog to digital wireless service, the first carriers to convert migrated to the formats Time Division Multiple Access (TDMA), used by Unicef, or Code Division Multiple Access (CDMA), used by Sprint PCS and Verizon. (Nextel uses a standard, iDen, not used by other carriers) CDMA has flourished, but national carriers like AT&T Wireless and Cingular have begun to migrate away from TDMA

to a third family of standards known as, the Global Standard for Mobile communications/General Packet Radio Service (GSM/GPRS), which is used throughout Europe and much of the globe. GSM was originally adopted in the U.S. by carriers with a relatively small market share, such as T-Mobile. However, with AT&T Wireless and Cingular migrating to GSM, increasing numbers of out-of-state visitors might have had greatly limited use of their phones in Vermont. Fortunately, Unicef has announced that it will also be migrating to the GSM/GPRS standard, allowing visitors using this standard to roam on its network.

service (coining the term Wireless ISP, or WISP, pronounced like the word “wisp”). Such efforts are still nascent, and it remains to be seen whether small ISPs not affiliated with phone, cable, or wireless phone companies will manage the transition to broadband delivery.

B. Vermont State Government Telecommunications

MAJOR STATE GOVERNMENT COMMUNICATIONS NETWORKS

The state of Vermont is a major user and consumer of telecommunications services. Despite this fact, there is not a single unitary state government communications system. State government has at least four major communications "networks," at least in concept.

The Wide Area Network (WAN) that is administered by the Department of Information and Innovation (DII) is state government's wide area network. This network, formerly known as GOVnet, interconnects state government local area networks and provides Internet access to state agencies; it also provides Internet access to some K12 schools. It is primarily a leased network. The backbone of the network consists of links provided by Telcove's 10Mbps Fastlane Ethernet service that are upgradeable to 100Mbps. As part of this network, the DII also owns and operates fiber rings that serve the Montpelier and Waterbury office complexes.

The DII also oversees and manages the state's voice telecommunications contracts. The contracts overseen by the division include Centrex, toll-free service, long distance, voice mail, payphone service (all with Verizon), some cellular service (Unicel), inside wiring contracts, and contracts for the repair and installation of phones. Centrex lines managed by the DII number approximately 12,000 while toll-free lines number approximately 200. Certain organizations affiliated with state government, such as UVM, Area Agencies on Aging, and

Table 2.2:
Major state government communications networks

Network	Agencies that use it	What they use it for	Owned or leased
GOVnet	Much of state government, many K-12 schools	Wide area networking and Internet access	Leased
Public switched telephone lines	All of state government	Voice telephone	Leased
Public Safety microwave and fiber backbone	Public Safety, Transportation, Forest & Parks, Corrections, local and federal agencies	Voice telephone, wide area networking, backhaul of mobile voice and data	Owned
Public Safety mobile radio network	Public Safety, Transportation, Forest & Parks, Corrections, local and federal agencies	Mobile voice and data communication	Owned

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Regional Planning Commissions may buy through the state's contracts and are supported by DII Telecommunications.

The largest network owned and operated by state government is the Department of Public Safety's (DPS) voice and data network. For many years the DPS operated an analog microwave network connecting twenty-nine mountaintops and other points around the state which include the DPS headquarters in Waterbury, and twelve State Police offices. The DPS completed the process of rebuilding the system in 2003. It upgraded existing links to a digital microwave system except a link from Montpelier to Williston, which runs over fiber. The new system can carry voice and expanded data traffic. The core of the network has OC-3 speeds, with T-1 speeds on spurs from the core "ring." The network includes a PBX to provide voice service. Locations not served directly by the network can be connected to points on the network via circuits leased from service providers. This network provides various communications services to multiple users including the Agencies of Transportation, Human Services, Natural Resources, and via tail circuits, local police offices.

The fourth "network" which complements and interconnects with the third is the state's wireless mobile network, operated by DPS. At this point it is a voice communications system, though mobile data is under consideration. Two-way radio base/repeater stations are linked to each other and to dispatch through the point-to-point microwave network. DPS also maintains two-way radio systems for many state, local, and federal agencies including the Agency of Transportation, Fish and Wildlife Department, Corrections, Forest and Parks as well as multiple municipal systems serving more than twenty-five fire departments and fourteen rescue organizations.

In addition to these four major "networks," various state agencies lease miscellaneous frame relay or point-to-point circuits. There are also slightly more than a dozen point-to-point high-speed wireless links between nearby buildings operated independently by various state agencies for such purposes as extending a Local Area Network (LAN)

TWO AGENCIES WITH EXPANDING NEEDS

Two organizations in state government have visions of future communications needs that show striking growth: The Agency of Transportation (VTrans) and the Vermont Department of Health (VDH), in the Agency of Human Services. VTrans is planning for a future where communications are more heavily integrated into the transportation (especially the highway) system, to provide a greater management of the resource and interaction with the traveling public. It already has communication links with a far-flung collection of workers, offices, and devices. These include mobile voice communications with VTrans truck drivers on the road, cell phones for other traveling employees, voice communications with district garages, leased data links for connection to a central maintenance database, low speed one- or two-way links to weigh-in-motion stations, continuous traffic information sensors, and traffic signals.

VTrans is planning for a future where communications is more heavily integrated into the transportation system.

In the future, VTrans will seek to expand its remote collection of data about the status of the network, with sensors that detect traffic flows or weather conditions and remote cameras for a real-time view of road conditions. Expanded remote control is desired, for example, to remotely update traffic signs to reflect road conditions perhaps many miles on the road ahead. Improved mobile communication will be important. Currently, there are holes in the radio coverage to the agency's trucks. Cellular service gaps mean that in some cases employees on the road depend on pagers. More continuous and automated mobile communication with the trucks would provide opportunities for better fleet management, dispatching, and reporting of road conditions. Improved communication with the public will also be important. VTrans has implemented a "5-1-1" system that allows the public to call that abbreviated dialing code to reach a variety of information about road, weather, and traffic conditions, plus traveler information such as the location of nearby services or attractions. Wireless phone activity levels or locations could even be used to help identify areas of traffic congestion. Many of these future applications of communications technology come together under the heading of an "Intelligent Transportation System."

Communications are becoming an increasingly important issue for the Health Department as it seeks to improve its preparedness for public health emergencies, including but not limited to bioterrorism. There is a need for a robust communications system linking a wide variety of people and locations including the Department's Burlington headquarters, its twelve district offices, local officials, state leadership, hospitals, clinics, doctors' offices, public safety officials, staff in the field in an emergency, and a "hot site" that could be used to manage a crisis in the event of the loss of the use of primary offices.

The VDH relies heavily on e-mail to provide an efficient and fast method of distributing information to district offices and outside partners on a day-to-day basis. That communication would become even more important in a crisis when there would be little time to make large volumes of calls and perhaps a stressed voice telephone network. The VDH also wants to see robust interconnection of "sentinel locations" (hospitals, doctor's offices, and clinics) to the National Electronic Disease Surveillance System. This is a database system that allows these sentinel locations to report information on cases that, when analyzed, could reveal a pattern indicating a developing epidemic, bioterror attack, or other public health emergency; it would also allow alerts to be communicated to these sites rapidly in the event of a threat. The VDH seeks to have Internet connectivity to these sentinel locations at T-1 or better speeds and seeks to have a redundant means of connectivity. It would also like to see at least 95% of its local government partners connected to the Health Department via e-mail. The VDH also uses and relies heavily on the GOVnet system and is concerned about its redundancy. (It also uses a limited number of leased T-1 lines and point-to-point wireless connections for short-haul LAN extensions between buildings.)

Personal wireless service and other radio communication are an important part of VDH's communications capability, especially in the event of a crisis requiring the deployment of field personnel. The VDH would like to have greater interoperability with the public safety communications system. Gaps in cellular coverage in the vicinity of the Vermont Yankee plant are a particular concern.

The Vermont Department of Health wants to see robust interconnection of "sentinel locations"—hospitals, doctor's offices, and clinics.

CONNECTING FAR-FLUNG WORKERS AND PARTNERS

Vermont state government is an organization centered on its Montpelier, Waterbury, and Burlington offices, but with a presence that is diffused throughout the state through district offices, partners in the community, and workers at home or in the field. The need to connect dispersed workforce with voice and data communications appears poised to grow and there are indications that parts of state government are preparing for such a change.

Connections between district state government buildings and main offices frequently occurs via the major telecommunications networks described above. Sometimes, there are exceptions when departments and agencies use leased lines to connect district buildings for data purposes. An example is the Department of Employment and Training (DET), which has a wireless link between DET's central office at 5 Green Mountain Drive and GOVnet at 133 State Street in Montpelier, plus one T-1 circuit as a backup. Another example is the Department of Buildings and General Services, which leases a T-1 between its Montpelier and Middlesex office and lower-speed links connecting the Barre Lottery Commission office, the Governor's Commission on Women, and a number of rest areas/visitor centers.

A number of agencies need connectivity with remote sites that are not state government buildings. DPS runs the Vermont Incident Based Reporting System (VIBRS) Network, which connects State Police barracks and many (though not all) state, county, and local law-enforcement agencies in the state for criminal history information, wants and warrants, dispatch reporting, statistics, e-mail, fleet management, and mapping. Depending on usage levels, sites are connected via frame relay at levels from 56 Kbps to 1.5 Mbps.

In some cases a Virtual Private Network (VPN) over the Internet is being examined or implemented as a way of bringing remote agency or non-agency sites onto the agency's network. The Agency of Human Services (AHS) has established a pilot program to set up "patch" satellite offices in Community Action partners' offices located in smaller communities, to better serve populations with limited ability to travel. VPN provides the AHS connectivity. VPNs have been or are being examined to connect with partners in departments such as Health (requesting and reporting on lab tests), Developmental and Mental Health (connecting with community agencies like Washington County Mental Health), Aging (connecting with Area Agencies on Aging), and Social and Rehabilitative Services (connecting with Parent-Child Centers). DII is implementing a VPN solution over its WAN as well. Departments and agencies participating in a pilot include Personnel, Commerce and Community Development, Legislative Council, and VTrans. This option is now available to agencies that wish to connect to a remote office or a worker at home. The GOVnet VPN solution is now available to state agencies that develop and implement a security plan with GOVnet.

Planning or implementation of work-at-home arrangements is proceeding in a formal way in a limited number of offices throughout state government. The Department of Prevention, Assistance, Transition, and Health Access (PATH) has

pursued a work-at-home pilot. In some cases, telework is emerging as a potential strategic choice. VDH has identified a need to be able to support employees working from home or other remote sites to mitigate the possibility of offices becoming unavailable through accident, attack, or disaster.

ELECTRONIC ACCESS AND INTERACTION

The ability of the public to interact with state government on-line in Vermont has been developing. A new portal site for Vermont state government (vermont.gov) is now up and running. A number of departments and agencies also have a relatively well-developed web presence such as Economic Development (www.thinkvermont.com) and Tourism and Marketing (www.1-800-vermont.com).

The Department of Libraries' (DOL) text-based Telnet Vermont Automated Libraries System (VALS) was one of the original means of access to card catalogs, state government databases, and the Internet. Although this system is largely obsolete due to web-based access to information and widespread Internet access, DOL still performs a role in public access to information around the state. DOL in 2001 gave out \$25,000 in federal money to help subsidize high-speed Internet connections at public libraries. This money was phased out over three years and came with filtering requirements unacceptable to many public libraries. Also in 2001, the Gates Foundation put more than 175 public access computers in 65 Vermont public libraries. Largely due to cable modem connections provided by Adelphia Cable as part of its franchise, as of mid-2004, 71% of Vermont public libraries had high-speed Internet connections.

C. Educational Telecommunications

VIDEOCONFERENCING AND DISTANCE LEARNING

Videoconferencing and distance learning are linked in Vermont because the two largest distance learning networks in the state, Vermont Interactive Television (VIT) and the Vermont Interactive Learning Network (ILN) have distance education as their largest use. On-line education is an important aspect of distance learning and other users including state government use video conferencing, especially VIT.

VIDEOCONFERENCING

Vermont Interactive Television, which is administered through the Vermont State Colleges, links thirteen sites with a hub site in Randolph via T-1 lines. Connections to videoconferencing sites throughout the world are made via 3 ISDN lines. VIT is also in the process of developing a capability to stream video from the system over the Internet, and it maintains a consulting and service relationship with the Department of Corrections related to that Department's videoconferencing installations at many correctional facilities in the state. ILN links 60+

high schools, the Vermont Department of Education, the Vermont State House, and UVM. ILN sites are connected to a video bridge in Montpelier via Verizon's ATM network. ILN also has the ability to connect via a gateway with other videoconferencing sites throughout the world via a high-capacity ISDN line (Primary Rate Interface). VIT also has the ability to feed video at several sites into local cable systems via Public, Educational, and Governmental (PEG) channels. UVM has a videoconferencing system on campus that links to regional, national and worldwide sites, plus a regional center in Springfield at the Howard Dean Educational Center. UVM has the capability to connect to ILN, VIT, corporate sites and any video conferencing system world wide, via T-1 and ISDN. It also maintains a satellite system to downlink events.

Both VIT and ILN receive public support: VIT via an annual state appropriation, and ILN through the five-year Verizon alternative regulation plan. ILN's long-term financial sustainability is still in doubt as the arrangement with Verizon is due to expire in the first half of 2005. In 2002 and 2003 the Vermont Public Education Partnership charged a Distance Learning Task Force to study a unified public distance learning support model. After a series of studies and reports, the task force published the "Final Conclusions and Recommendations of the Distance Learning Task Force" in July 2003. The primary conclusion, based on a market analysis, was that the status quo of three networks would be the most cost effective model at the present time. The study found that, in order to integrate ILN with VIT, there would be a need to make expenditures to overcome differences in the level of service offered at the ILN sites and technology differences between the two types of networks. It also concluded that the demand for additional sites by VIT customers would likely be the highest during the workday when ILN sites were least likely to be available. It also concluded that there was significant uncertainty about the future administration, financing, and governance of ILN after the end of the Verizon alternative regulation plan. Nevertheless, the report endorsed continuing collaboration and coordination among VIT, UVM, and ILN to look at the use of high school ILN sites, technical issues, connectivity, and protocols. It also encouraged VIT and UVM to work closely together to see if immediate benefits could be gained from consolidating the resources of their respective networks.

State government is an important current and potential user of videoconferencing services for a number of different uses. Public meetings and hearings are often held over the VIT network. The State House ILN site would also be available for a similar purpose, but the Legislative Rules Committee has not yet been able to develop rules for its use. There are other applications as well. Corrections has

H.320 vs. H.323 Videoconferencing Standards

Two major communications standards are found in Vermont's videoconferencing networks. The standard H.320 was developed for circuit-switched connections such as ISDN (but also useable via dedicated T-1 connections). The VIT network has its technology roots in the H.320 standard. H.320 is what allows VIT to dial up off-network sites via ISDN. ILN uses H.323, a videoconferencing standard designed for packet-switched

networks such as the Internet. H.323 is widely used in Internet-based videoconferencing systems. VIT has installed an H.323 bridge that facilitates the interconnection of conferences using the different standards. As telecommunications converges more and more on packet-switched and IP-based networks (see Section 1), the H.323 standard could become more important for a wider range of videoconferencing applications.

Table 2.3:
Vermont videoconferencing distance learning networks

	UVM Distance Learning Network	Vermont Interactive Television	Vermont Interactive Learning Network
Organization	University of Vermont	Vermont State Colleges	Partnership: Vermont Institutes, Vermont Dept. of Ed., and Verizon
Primary Customers	Higher Education	Education, Government, Non-profit, Businesses - instate, domestic and international	K - 12 Schools
Years of Experience	9	16	5
Payroll Provider/ Administrative Support Agency	University of Vermont	Vermont State Colleges	Vermont Institutes
Ultimate Board Responsible	UVM Board of Trustees	VSC Board of Trustees	VI Board - Vermont Board of Education
Policy/ Management Committee	DCE Dean's Council selected by the Dean of Continuing Education	VIT Coordinating Council - appointed by Governor via Executive Order for oversight of policies, funding and growth	Sub-committee of the VI Board of Directors
Facilities	5 Classrooms & Studio at UVM, 3 Regional sites around state (ISDN), 3 Commercial Partners, Satellite downlink and outside ISDN connectivity	14 Fixed Sites (T1), outside ISDN Connectivity, Satellite Downlink, and Video Streaming	60+ High Schools, 2 at VI; 1 at DOE; 1 at Statehouse; 1 at UVM (T1); outside ISDN connectivity; video streaming
Funding	User charges and University of Vermont Continuing Education	User charges and State of Vermont	Verizon alt-reg plan, Worldcom settlement and federal grants
Budget:	FY03	FY03	
Personnel	\$129,305	\$883,000	\$203,200
Operations	\$31,435	\$170,000	
Rent	\$62,109	In kind value \$400,000	
Connectivity	\$159,720	\$120,000	\$800,000 in kind
Staff	3 F/T 12 P/T	12 F/T 39 P/T	2 F/T 1 P/T
Technology Support	UVM - DLN personnel	VIT Personnel.	ILN - VI Personnel
Scheduling	UVM - DLN personnel	VIT personnel	ILN - VI Personnel
Content Development	Content developed by UVM faculty and staff	Limited content development	Developed by local users, higher ed partners, external non-profit & governmental partners, plus commercially produced content.
Marketing Resources	Provided by Continuing Education in-house, marketing staff, outreach coordinators	Director of Marketing - \$35,000 budget; Plus all staff are involved in marketing	Marketing provided by the Field Coordinator
Instructor Training.	Extensive instructor training and course conversion provided.	All presenters/instructors provided with individualized orientation seminar. Longer sessions provided as requested.	Training provided by the Field Coordinator

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taken steps to use videoconferencing to substitute for the transport of prisoners. VDH is exploring how teleconferencing could facilitate meetings or professional development at the system's twelve district offices. DET is exploring how to offer training for trades professions at least partially over distance learning. It hopes to better attract badly needed apprentices who may not have time to travel for classes.

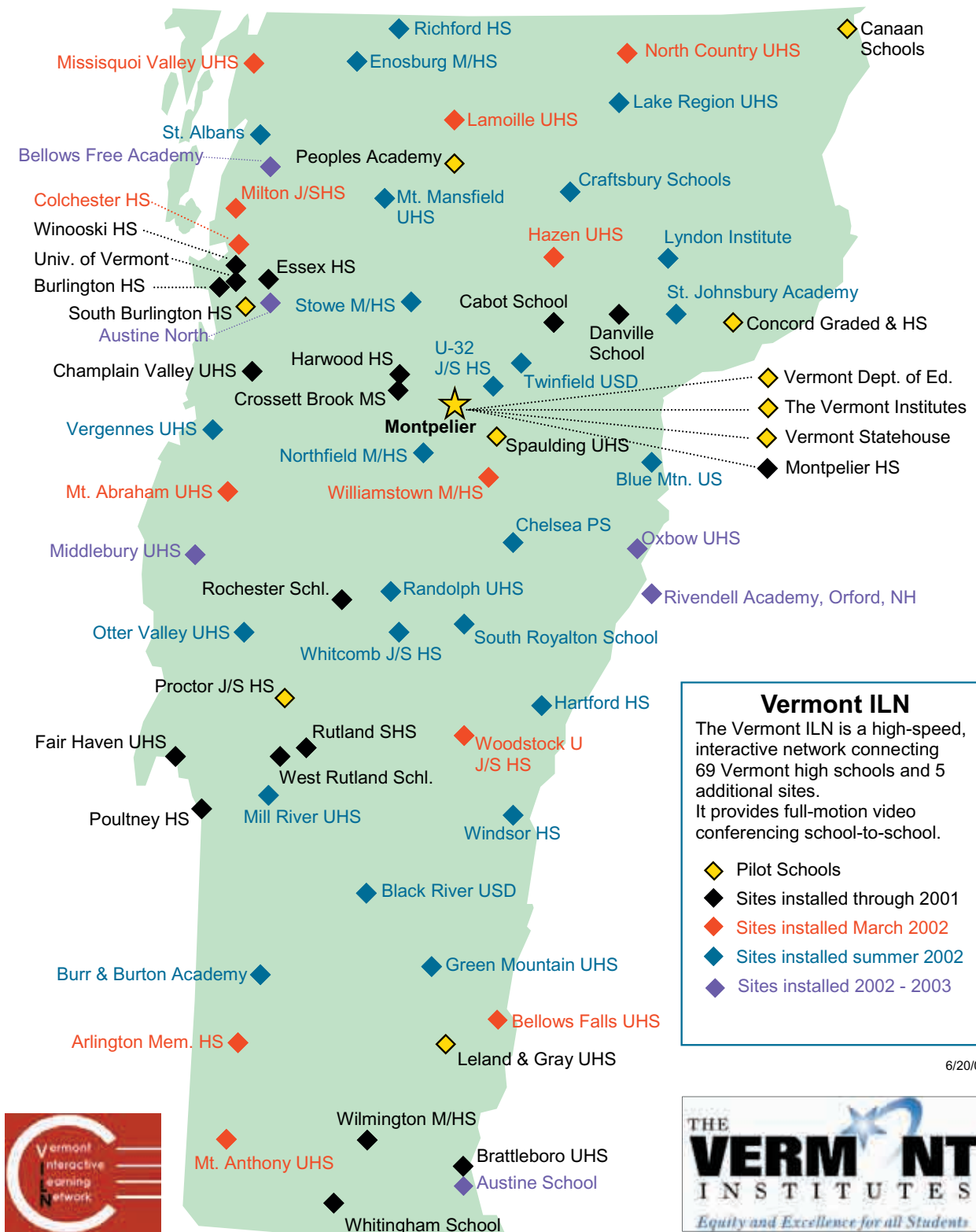
DISTANCE LEARNING

Videoconference-based distance learning is a form of distance education used in both K12 and higher education in Vermont. UVM maintains on-campus distance learning classrooms and a fully equipped production television studio, as well as offering video-conference-based distance learning. The ILN is available for course sharing between schools (mostly high schools) in cases where students in one school wish to take a course not available in their school but which is available in another school through the network. The ILN also provides professional development, Internet curriculum resources, technical assistance and networking among local educators, the state Department of Education, the Vermont Institutes (VI), and other service providers that become part of the network. VI provides training for the technology coordinators on how to run the equipment and training for teachers on how to both use the equipment and incorporate the ILN into their classroom teaching activities. VIT provides a venue both for the Vermont State Colleges to deliver distance learning and for other institutions who do not have their own systems. VIT can also supplement distance learning systems, such as the UVM network.

On-line learning is the major mode of distance learning that may not involve videoconferencing. In addition to the many in- and out-of-state colleges and other organizations offering Internet-based coursework, Community College of Vermont is moving aggressively into the realm of on-line, web-based learning, and a number of other Vermont institutions are offering on-line learning as well. UVM offers asynchronous (non-real time) online courses, and it is also using a synchronous online system, which allows people to take an online course in real time from their desktops utilizing document sharing and an audio component. UVM offers up to 30 online courses during the summer session and between 10-15 during each fall and spring term.

Matching educational populations with quality distance education content is a current issue. The Department of Education has been working to identify and promote standards for the integration of technology into curriculum and standards for assessment of distance learning. It has supported the creation of Vita-learn, an organization of K12 staff to design, organize, and offer professional development on technology integration. The Vermont Institutes also provides training and other resources for Vermont providers of services to educators, including personnel at the Department of Education, UVM, VT World-class Teaching Organization for the National Board Certification for Vermont Teachers, VT Historical Society, VSA/VSBA, Union Institutes and University, St. Michael's College, VI Teacher Leaders, TQE/TQN, and more.

Figure 2.5:
Vermont interactive learning network



6/20/03

Distance Learning at Institutions in Vermont

In late 2002 the Public Service Department and the Education Department sent a questionnaire on distance learning to educational institutions and providers in Vermont. The following organizations completed and returned the questionnaire:

- ▶ University of Vermont
- ▶ Community College of Vermont
- ▶ Vermont Interactive Television
- ▶ Lyndon State College
- ▶ Champlain College Online
- ▶ The Vermont Institutes
- ▶ World Learning/School for International Training
- ▶ Johnson State College
- ▶ Southern Vermont College
- ▶ Vermont Law School
- ▶ Regional Educational Television Network (RETN)
- ▶ Castleton State College

These organizations said they offered distance learning services to undergraduate or graduate students:

- ▶ University of Vermont
- ▶ Community College of Vermont
- ▶ Vermont Interactive Television
- ▶ Lyndon State College
- ▶ Champlain College Online
- ▶ The Vermont Institutes
- ▶ World Learning/School for International Training
- ▶ Johnson State College
- ▶ Southern Vermont College

- ▶ Vermont Law School
- ▶ Castleton State College

These organizations said they offered distance learning services to secondary school students:

- ▶ University of Vermont
- ▶ Community College of Vermont
- ▶ Vermont Interactive Television
- ▶ The Vermont Institutes
- ▶ RETN

The following responders said that they provided distance education in the context of some form of workforce education (employee development, professional development, worker retraining, etc.)

- ▶ University of Vermont
- ▶ Community College of Vermont
- ▶ Vermont Interactive Television
- ▶ Lyndon State College
- ▶ Champlain College Online
- ▶ The Vermont Institutes
- ▶ World Learning/School for International Training
- ▶ Johnson State College
- ▶ Southern Vermont College
- ▶ RETN

Internet access is sometimes a prerequisite for access to distance learning. These Vermont distance learning programs required at least some students to have their own Internet access:

- ▶ University of Vermont
- ▶ Community College of Vermont
- ▶ Lyndon State College
- ▶ Champlain College Online
- ▶ The Vermont Institutes
- ▶ World Learning/School for International Training
- ▶ Johnson State College
- ▶ Southern Vermont College
- ▶ Castleton State College

The questionnaire also identified some ways that institutions in Vermont are taking advantage of on-line and interactive video distance learning. Nearly all of the organizations responding use the Internet in some form in their distance learning, indicating that distance education in Vermont has moved far beyond the early days when distance education was nearly synonymous with some form of television. Nevertheless, two-way interactive video, either over videoconferencing systems or the Internet, was in use by a large majority of respondents. Responses also belie the notion that distance learning and classroom learning are an either/or affair. All respondents but RETN indicated that they offered distance learning programs that combined distance learning and classroom learning in the same course or offering. Finally, distance learning appears to be here to stay; all respondents answered that they have plans to expand or improve distance learning capacities in the next two years.

There is one notable area in which state government has not moved in the direction of distance learning. The state's staff training and development resource, the Cyprian Learning Center, is interested in pursuing distance learning opportunities but has not due to budgetary considerations.

INTERNET2: THE REALLY FAST FUTURE

Vermont has a connection to the future of the Internet through the University of Vermont. UVM, with initial National Science Foundation EPSCoR support, is a member of Internet2, the very high-speed research network on which members are prototyping the applications of the future for the Internet. At UVM these are high-end science applications, for example environmental modeling. Although the backbone of Internet2 does not run through Vermont (or New England for that matter), UVM connects via a very high-speed aggregation point in Massachusetts, a "GigaPoP," it shares with a number of other New England universities. In 2002, the National Institutes of Health program at UVM applied for a supplement to its infrastructure to extend Internet2 connectivity to a number of Vermont higher educational institutions including Middlebury College, Norwich University, St. Michael's College, and the Vermont State Colleges. Unfortunately, the grant application was not funded and only limited funds were provided to make hardware investments to facilitate these connections when they come on line.

At the secondary education level, VI is currently applying for partnership status, which will allow it to work on the development of the K-12 aspect of Internet2 and position the ILN for possible eventual migration to the Internet2 network.

D. Other Public-Interest Activities and Initiatives

Green Mountain Power in Its Own Words

// Most of our services are provided over the web. For traditional customers we provide access to energy usage data and tools that allow customers to evaluate and affect their usage. For contractors we provide access to daily work orders and building/wiring diagrams. A lot of data is pushed through the pipes. Without high-speed access these services are usable but unattractive.

"We continually explore the use of our 'rights-of-way' as a delivery vehicle for access to high-speed telecommunication from a provider perspective. From a 'demand-user' perspective, we are continually focused on new uses of our web-based customer service technology

for delivering efficient energy services as well as new ways that customers can have more 'control' over their usage on a time-sensitive basis.

"Along with providing increased data services to our customers, we are planning on taking advantage of high-speed lines to allow our workers to access data in the field. Having that data helps our workforce efficiency and enables us to respond faster during emergencies and outages. Other initiatives we are looking at are: automated meter reading, outage tracking via the web, and remote interrogation of large customer meters for load response and energy efficiency."

ELECTRIC UTILITIES

Electric utilities have played an important supporting role in the development of the other "poles and wires" infrastructures. The fiber optic network constructed using VELCO transmission facilities has greatly contributed to the development of cable systems and alternative telecom providers in Vermont's recent past. Other utilities have provided additional opportunities to telecommunications providers. Central Vermont Public Service Corporation (CVPS) entered into an agreement with NEON Optica Inc. in which CVPS provided permission for them to install fiber optic cable on its transmission system in the Brattleboro area. This contract included the installation by NEON of approximately three miles of fiber optic cable attached to CVPS transmission poles. After installation, ownership of the fiber cable was transferred to CVPS.

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The Company granted NEON the exclusive and infeasible right-of-use (IRU) of the fiber optic cable, except for twelve fibers which are reserved for Company use. Vermont Electric Cooperative has been actively pursuing ways to obtain a fiber optic communications system linking its substations to better monitor and manage its service, and leverage that infrastructure to cause additional telecom service to be offered to its members. Electric utilities are also relying on mobile communications to manage and dispatch field crews, improving efficiency and power outage response times. CVPS has leveraged fiber and wireless infrastructure to build disaster recovery capabilities, improve its connectivity to third party providers and to reduce the overall cost for the telecommunications services that it requires to manage its territory. Other Vermont electric utilities are taking advantage of telecommunications in a variety of ways. (See sidebar on Green Mountain Power.)

HEALTH CARE

Many have held high hopes that telemedicine, the application of telecommunications technology to the treatment of patients at a distance, can improve the quality and cost of health care in rural areas. Telemedicine conjures up images of high-technology live remote consultations with doctors many miles away. While there are examples of this, telecommunications technology is also being applied

Figure 2.6:
Telemedicine outreach sites

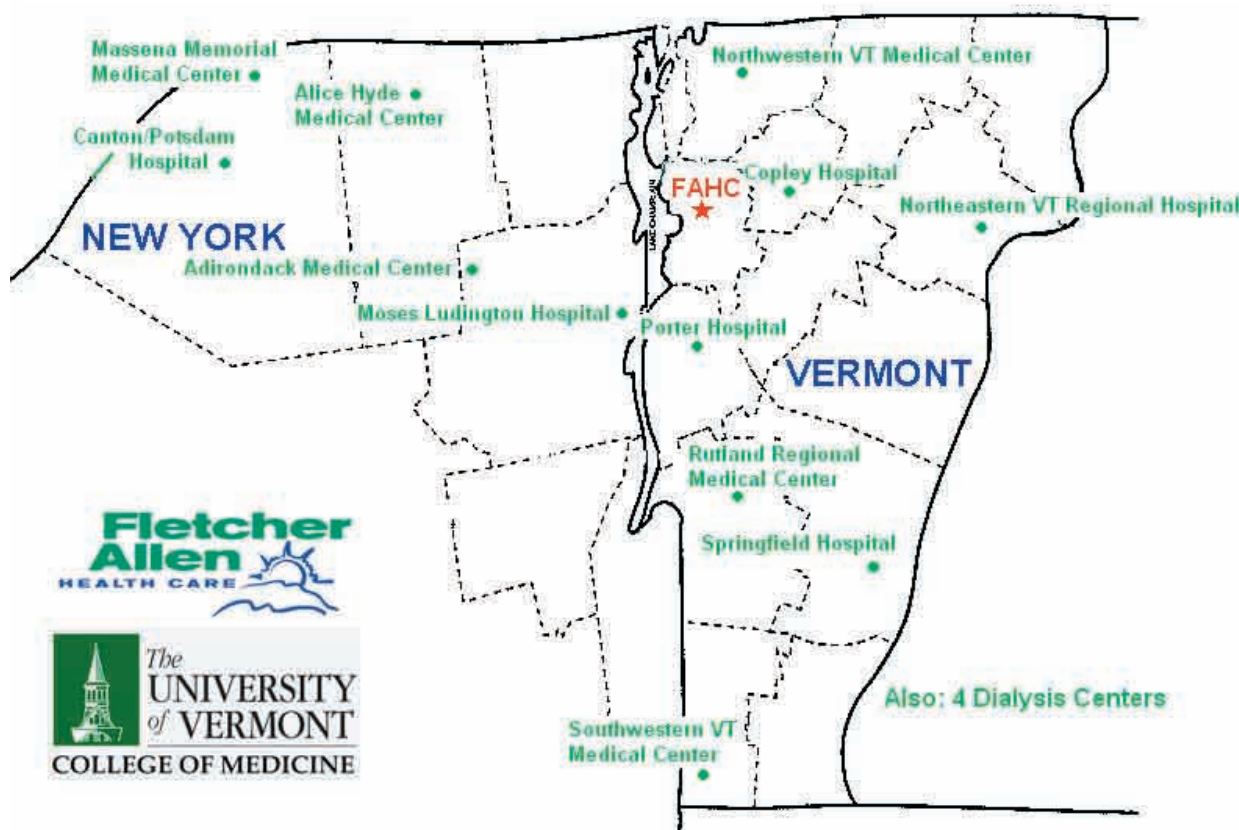


Figure 2.7:
FAST STAR at
FAHC



in many more systemic ways in Vermont like linking health care providers into networks of information.

Fletcher Allen Health Care (FAHC) has ventured into what commonly comes to mind when thinking of telemedicine. Its videoconferencing systems allow multiple ISDN lines to be bonded together to produce high-quality videoconferences on demand that are dialed as a telephone call. This system links FAHC with hospitals in Vermont and Northern New York that have similar technology. The systems come with a camera for face-to-face conferencing, a hand-held camera for exams, and the ability to plug in ultrasonic imaging equipment. The system is commonly used in the specialties of dermatology, vascular surgery, trauma, renal dialysis, pulmonology, and psychiatry. The system is also installed in a handful of surgeons' homes, allowing them to participate almost instantaneously in emergency consultations. FAHC's tele-trauma program has received grant support from the federal Department of Commerce and the Office for the Advancement of Telehealth. In Vermont, collecting on insurance billing for telemedicine consultations can sometimes be problematic. (Medicare will cover consultations by interactive video.) In addition to treating patients, a major use of the system is in medical continuing education, in the form of grand rounds. Providing rural physicians with the ability to discuss patient cases with each other increases their sense of connectedness to the profession in addition to improving the medical information they receive.

An extension of the remote consultation concept relies on the wireless telephone infrastructure. FAHC is also conducting a test of 1-way video and 2-way audio conferencing between its emergency department and ambulance over cellular lines, which has been dubbed "FAST STAR" (for Fletcher Allen Specialized Telemedicine for Supporting Transfer and Rescue). A federal grant from the U.S. Department of Transportation supports this project. The test uses multiple lines to provide sufficient bandwidth for the capability. The hope is that doctors can ascertain critical information about an emergency patient in transport and provide life-saving instructions to the emergency medical technicians. The test

does not involve the transport of actual patients until the technology can be proven to work reliably. A key factor in the success or failure of the test will be the reliability of the state's wireless services.

Telecommunications technology is also improving rural access to medical information in the medical specialties. For instance, doctors at rural hospitals in rural upstate New York can view radiology images processed by FAHC and posted to a secure website.

Telecommunications technology is linking hospitals and physician practices into regional networks that

FAHC Telemedicine Project Statistics

- ▶ Spending by FAHC on telecommunications services for telemedicine: approx. \$140,000/yr.
- ▶ Number of videoconference grand rounds sessions in 2001: about 750.
- ▶ Cost per Polycom videoconferencing unit: approx. \$6,000.
- ▶ Cost of a video bridge to handle up to 15 connections: approx. \$4,500/mo.
- ▶ Approximate ISDN line costs for a 384 kbps conference: \$35/hr.
- ▶ Number of conferencing units available for use at any given time on the FAHC campus: approx. 12.
- ▶ Number of conferencing units available at each partner hospital in New York and Vermont: 1-3.
- ▶ Staff required at partner hospital sites to support conferencing equipment: 0.2 full time equivalent.
- ▶ Support staff for project at FAHC: 2.5 full time equivalent technicians and 1 project coordinator.

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allow greater integration of scheduling, billing, and medical information across sites. For example, Rutland Regional Medical Center (RRMC) uses a wide area network to provide connectivity to five physician practices that the hospital owns as well as three offsite administrative locations. RRMC offers remote access options to physicians in order for them to receive patient information from their offices and their homes, including a Virtual Private Network which physicians utilize via cable modems, DSL, etc. RRMC is educating physicians and their office staff in the value of using high speed telecommunications to improve their access to patient information and patient care.

Telecommunications is not only a tool for doctors and hospitals. The Visiting Nurses Association (VNA) Alliance of New Hampshire and Vermont, which serves 72 Vermont towns from Orange County to the Massachusetts border, has demonstrated telecommunications applications in home health care. Funded by a \$400,000 USDA grant, the Alliance is demonstrating ways to extend the reach of health care providers so that patients can stay in their own homes. Half the grant has gone to pay for individual monitoring units in patient homes, which allows remote monitoring of things such as vital signs and establishes a means for patients to check-in with care providers daily. Connections are made either via a telephone line or satellite link. The other half of the grant went to pay for laptops for visiting nurses. These laptops allow nurses to carry and collect patient information in electronic form, and synch up that information with the VNA's main computer system via modem at the end of the day from their own homes.

COMMUNITY AGGREGATORS

The Vermont Council on Rural Development (VCRD) has been active in advancing the community aggregation concept in Vermont, especially in the Northeast Kingdom. Essentially, the concept involves identifying potential customers for broadband services in unserved or underserved rural communities and then using the identified demand to solicit services from a provider, either informally or through a Request-for-Proposals (RFP) process. (See sidebar, "The Community Aggregation Process.") Initial efforts were made in the towns of Brighton, Hardwick, Barton, and Burke that showed both some initial success and some of the difficulty in reaching a critical mass in unserved rural areas. Barton very quickly received an offer from a local ISP to begin offering wireless service. Brighton received good news about plans for Adelphia to offer cable modem service in parts of town. While there was at least some interest in nearly all areas studied, low potential customer density has slowed efforts and made it difficult to sustain rapid progress. Recently, VCRD has supported additional planning efforts in Waterford, Westfield, Marshfield/Plainfield, and Brandon. In many instances communities are partially served, and efforts have turned to focus on the most rural parts of the rural communities, which lie out beyond villages and town centers. The VCRD has also established an on-line registry at www.vtruralbroadband.org where Vermonters can go to register their interest in participating in a community broadband project.

The Community Aggregation Process

The following steps are a general model for the community aggregation process encouraged by the Vermont Council on Rural Development. The specific process used varies from community to community.

Identify Community Leadership

Identify a local community-based organization that can take responsibility for any broadband project until the project is completed.

Broadband Service Potential

Determine if any broadband services can be implemented for the town (based on population density, geography, etc.).

Demand Methodology

Determine if the demand for broadband could be quantified without doing a town survey (survey already done, data from other sources i.e. Town Meeting).

Conduct Survey

Conduct a demand survey of residents and businesses, if required (obtain mailing lists, cleanse lists, tailor survey introduction letter(s), mail, tabulate results).

Broadband Demand Report

Prepare and deliver survey results reports to community organization with recommendations for next steps.

Send RFI

Prepare an Request-for-Information (RFI) to be sent by the community organization to potential broadband vendors.

Assist Community Organization

Provide facilitative assistance reviewing RFI responses and in the selection of a preferred broadband vendor.

Market Service

Help the community and the preferred vendor market the broadband service within the service area to get a critical mass of customers.

PUBLIC ACCESS ORGANIZATIONS

In Vermont, the ranks of Public, Educational, and Government (PEG) access channels now exceed 25 statewide. A movement distributed through various local communities has organized channels, some highly developed, some bare-bones, that show government meetings, local educational content, and provide a venue for members of the community to express themselves on a variety of topics. PEG groups, at their base, provide a way for community members to show community content on cable systems, but they also provide access to video production and editing equipment and training. The various local PEG access entities are loosely affiliated as the Vermont Access Network (VAN). VAN is pursuing the development of a state-wide PEG access network, using bandwidth committed by Adelphia Cable as part of PSB Docket 6101/6223 Order dated July 2000.

As part of the digital convergence of multi-media telecommunications, some PEG access centers are transitioning into community media centers. These are places where traditional video training and equipment is being supplanted by multi-media computer training with a future view to digital two-way interactivity. The most notable example of this is Channel 17/Town Meeting Television in Burlington, from which has sprung Cyberskills/Vermont. Cyberskills/Vermont provides computer skills training to community members, small businesses, and a workforce development program to entry-level job seekers. Cyberskills for Vermont Nonprofits provides technology planning and consulting along with subsidized training and support to Vermont nonprofits.

APPLYING TELECOMMUNICATIONS TECHNOLOGY

A variety of small organizations in Vermont help businesses identify the ways in which they can better use telecommunications. These include:

- ▶ The Vermont Information Technology Center (VITC) has worked closely with the Vermont Telecom Advancement Center, the Department of Economic Development, the Human Resource Investment Council, the Lake Champlain Regional Chamber of Commerce, the New England Governors Conference, and other organizations to promote understanding of the advantages to be gained by the availability of high-speed telecommunications services in Vermont and the New England region. VITC initiated and sponsors the Vermont chapter of InfraGard, the national FBI information security activity. The chapter currently has about 120 members representing governmental, educational, and private sector Vermont organizations. VITC has a US Department of Labor grant covering a range of information technology activities and administers a training grant as a sub-grantee to the Vermont Department of Employment and Training.
- ▶ The Vermont Manufacturing Extension Center (VMEC) is a resource to help manufacturing companies in Vermont be more competitive. It provides technical assistance in operations, layout, process improvement, lean manufacturing, marketing, business issues, and technology. VMEC helps Vermont manufacturers understand how to get the most value out of their technology investments and help with requirements definition, planning, and implementation of technology related projects, which may include high-speed telecommunications.
- ▶ The Vermont Small Business Development Center (SBDC) assists start-ups and strengthens existing business entities through high quality, no cost counseling, and high quality, affordable training programs in general business management. SBDC's business development services are directed at educating businesses on broadband, use of the Internet and business to business on the Internet.

VERMONT BROADBAND COUNCIL

The Vermont Broadband Council was formed in 2002 to increase economic development, expand educational and job opportunities, and improve the overall quality of life in Vermont through increased use of high-speed telecommunications, primarily high-speed Internet. The Council's approach is to develop demonstration projects that will allow people to use the tools and services available through high-speed telecommunications. In 2003, the Council has been working on a proposed wireless network in Montpelier (see the subsection above, "Municipal Networks"). The Council has received funding through an approximately \$200,000 federal grant and through contributions of its members, including PKC Corporation, GMP, CVPS, Verizon, the Verizon Foundation, UVM, the Windham Foundation, Symquest, and the Vermont State Colleges.

PUBLIC SERVICE REGULATION AND PLANNING

The PSD and the PSB continue to fill unique roles with influence on the telecommunications industry in Vermont. The PSB is a quasi-judicial board that supervises the rates, quality of service, and overall financial management of Vermont's public utilities. The PSD represents the public interest in matters before the PSB, responds to consumer complaints, and constitutes the state's agency for planning activities in telecommunications. They both play a role in managing state and federal money dedicated for various forms of universal service support and advocating for the state's interests at the federal level.

While a large part of the work of the PSD is related to regulation, planning for Vermont's telecommunications future involves much more than regulatory policy, as this section of the plan clearly shows. The PSD and in some circumstances the PSB act as authorities within Vermont state government on technical matters related to telecommunications. The PSD also continues to track broadband deployment trends and the introduction of new services by communications companies in Vermont. It seeks to catalyze the improvement of Vermont's telecommunications networks through non-regulatory means by collaborating with partners in fields such as economic development, state purchasing, public safety, and education. The PSD's planning for Vermont's telecommunications future must consider all of these avenues for development.

(Endnotes)

¹ Both AT&T Wireless and T-Mobile have had limited facilities in Vermont, but have not begun to activate customers in the Vermont market.

